NRCS NEW MEXICO ACTION PLAN FOR FISH AND WILDLIFE HABITAT CONSERVATION

United States Department of Agriculture

NRCS
6200 Jefferson NE,
Room 305,
Albuquerque,
New Mexico
87109

Phone 505-761-4400
Fax 505-761-4463
Website:
www.nm.nrcs.usda.gov

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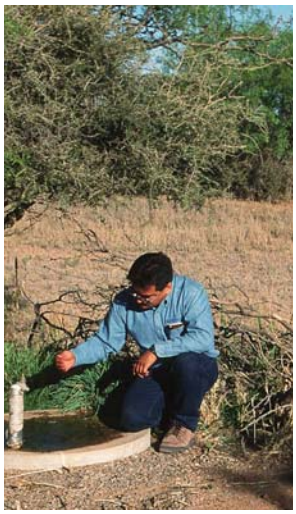

INTRODUCTION

The Chief's 2005 Action Plan for Fish, Wildlife and Wetlands calls for NRCS leadership at the national and state level to recognize and promote fish and wildlife conservation as an agency priority. Also identified was the need to ensure all NRCS programs use their authorities to address fish and wildlife concerns and to focus conservation efforts on habitats and species of greatest conservation need. A national NRCS oversight and evaluation report completed during 2004 for the Wildlife Habitat Incentives Program (WHIP) also states the need to focus conservation efforts in order to have any meaningful effect.

As a result of national and state leadership, special NRCS program and cost-share initiatives have been directed to promote conservation of high priority species and habitats (e.g., Pacific and Atlantic salmon; riparian restoration in the southwest; sage grouse; northern bobwhite quail habitat restoration, bull trout and cutthroat trout initiative. Recent Memorandums of Understanding have been signed at the national level with multiple partners (Restore America's Estuaries, U.S. Fish and Wildlife Service, Quail Unlimited, Wild Turkey Federation, to name a few) to help deliver effective conservation for the Nation's fish and wildlife resources.

This action plan for New Mexico NRCS uses the Comprehensive Wildlife Conservation Strategies for New Mexico (CWCS) to identify habitats for the Species of Greatest Conservation Concern. Additionally, the CWCS prioritizes conservation actions for those habitats. NRCS selected a subset of those actions which the NRCS has both the authority and expertise to act. This action plan is a

dynamic document to be adapted to address changing or evolving conservation issues as identified by NRCS and its conservation partners.

Some identified habitats and resource concerns may be addressed under the authorities of multiple NRCS programs or one program may be ideally suited to help solve a particular concern or suite of concerns. Projects that enhance habitat essential for the survival of federally protected species or those species that are candidates or proposed for listing under the Endangered Species Act have priority. The Endangered Species Act of 1973 (ESA), as amended, requires Federal agencies to use their authorities to actively support the goals and objectives of the Act. NRCS National Policy states the Agency's intent to ensure conservation of federally protected species through implementation of its programs. Conservation of federally protected species and species in decline is an objective of the Environmental Quality Incentives Program (EQIP), Grassland Reserve Program (GRP), Wetland Reserve Program (WRP), and Wildlife Habitat Incentive Program (WHIP).

GENERAL

The diversity of wildlife habitat in New Mexico demands a wide variety of habitat improvement practices and management. New Mexico contains elevation changes ranging from 3000 feet above sea level to 12,100 feet, from Chihuahuan desert to tundra, from river bottom to mountain peaks. Most of the state is above 4,000 feet elevation. Approximately 50% is privately owned. Major habitats include the great plains on the eastern one-third, the Rocky Mountains on the western two-thirds with river valleys scattered throughout and the southern deserts.

Many landowners want to improve their land for wildlife both as a primary resource concern or as a secondary resource concern incorporated with production agriculture. The following habitats have been identified as priorities for wildlife conservation in the CWCS for New Mexico. This list has been pared to select those habitats that may best be treated through NRCS programs and technical expertise.

Chihuahuan Semi-Desert Grasslands

Habitat Condition

Chihuahuan semi-desert grasslands are found throughout the Chihuahuan Desert Ecoregion. As with other grassland communities in the western United States, this habitat type experienced a marked shift from perennial grassland to shrub-dominated desert scrubland around the mid 1800s (Barnes 1936, Buffington and Herbel 1965, Branson 1985, Archer 1989). The exact cause of this shift is debated, but excessive livestock grazing, climatic change, and fire suppression have been implicated (Fredrickson *et al.* 1998). In turn, grassland conversion and human-caused fragmentation have caused increased runoff and erosion, decreased biological diversity through isolation and reduced carrying capacity (Saunders *et al*. 1991), shifts in avian species assemblages, increased invasion by non-native species, and decreased livestock and wildlife forage (Branson 1985, Vickery *et al*. 1999, Desmond *et al*. 2005). Today, portions of the type appear to be undergoing additional desertification (Asner 2005).

Problems Affecting Habitat or Species

Grazing Practices

Livestock grazing has economic and cultural values that are important to individuals, and communities in the Chihuahuan Desert. Impacts of livestock grazing on rangeland wildlife in the Chihuahuan Desert are largely dependent on the grazing management practices used. Domestic livestock and wildlife grazing practices that reduce the ability of the land to sustain long term plant and animal production (Wilson and MacLeod 1991), may lead to the loss of grassland cover, mortality of plant species, and increased erosion.

Fire Regimes

Altered fire regimes, resulting from both fire suppression and the removal of fine fuels by domestic livestock and wildlife may also promote the establishment of both woody vegetation and non-native species. However, the extent to which fire occurred in southwestern grasslands varied geographically and is related to climatic variables such as seasonal and annual rainfall and physiographic variables such as elevation, slope and aspect (Archer 1994).

Non-Native Species

Many ecologists have acknowledged the problems caused by invasion of non-native species into communities or ecosystems and the associated negative effects on global patterns of biodiversity (Stohlgren *et al.* 1999). Once established, invasive species have the ability to displace native plant and animal species (including threatened and endangered species), disrupt nutrient and fire cycles, and alter the character of the community by enhancing additional invasions (Cox 1999, Deloach *et al.* 2000, Zavaleta *et al.* 2001, Osborn *et al.* 2002).

Other problems affecting habitat or species identified in the CWCS are military and borderland security activities, off road vehicles, development and exploration, and diseases and pathogens. These factors are beyond the scope of this plan and the authorities of NRCS and its programs.

Prioritized Conservation Actions

1. Identify and promote grazing systems on rangelands that ensure long-term ecological sustainability and integrity and are cost effective for livestock interests.

2. Reduce shrub encroachment in Chihuahuan semi-desert grasslands habitats important to SGCN. Implementation of this conservation action may include chemical or mechanical manipulation, reseeding with native grasses, or reduction of processes that promote shrub encroachment.

NRCS Programs: WHIP, EQIP, CSP

Western Great Plains Sandhill Sagebrush Shrublands

Habitat Condition

The Western Great Plains Sandhill Sagebrush Shrublands are a mosaic of hummock and coppice dunes dominated by sand sage and/or shinnery oak with a mixed grass and tallgrass composition. The habitat type is found in the Chihuahuan Desert and the Southern Shortgrass Prairie Ecoregions. In the Chihuahuan Desert Ecoregion, sites dominated by sand sage and purple pea are largely found in central New Mexico adjacent to the middle Rio Grande corridor. Grasses in these sites consist of Indian ricegrass, little bluestem, and sand dropseed. The Western Great Plains Sandhill Sagebrush Shrublands habitat is considered a climax vegetation (Rosiere 2000) although, there is anecdotal evidence suggesting that the dense stands of shinnery-oak and sand sage on the high plains of eastern New Mexico are a result of intense grazing pressure. Soils in this habitat type are typically deep and well drained with surface textures consisting of aeolian fine sands or loamy aeolian fine sands. These soils often extend to a depth of 60 in (152 cm) or more. Water holding capacity is low, and the soils are highly erodible. When organic residues and vegetative cover are removed, landscapes typically are converted to unstabilized dunes (Natural Resource Conservation Service 1997; Ecological Site Description, Sandhills). Soils in dune areas are well drained and grade to a shallower calcic hardpan overlayed by a shallow sand at the southwestern and southern boundaries of this ecological site. Shallow soil sites are typically dominated by buffalograss, blue grama and threeleaf sumac or littleleaf sumac.

Continuous year-round or season-long summer grazing (April through October) have reduced the once dominant tall- and mixed cool season grass species including New Mexico feathergrass, needle and thread grass, and Indian ricegrass. Today, large portions of the type are dominated by sand dropseed, sand sage, soaptree yucca, and threeawn species with lower cover and productivity values (Natural Resource Conservation Service 1997; Ecological Site Description, Deep Sand). Season-long summer use by livestock has also reduced both the amount of forbs and warm season grasses found in this habitat type and their concomitant production of organic litter on the soil surface. In the northern reaches of the Chihuahuan Desert Ecoregion, Rosiere (2000) noted that sand sage has increased on overgrazed ranges and abandoned farmlands to densities similar to those of the Intermountain West's big sagebrush steppe. However, shrub components of this type remain important in terms of nutrient cycling and ecosystem function where sagebrush, shinnery oak, and subdominant shrubs trap and accumulate nutrients around their bases forming "islands of fertility" (Schlesinger and Pilmanis 1998). This accretion of organic matter and nutrients is especially important to insects and ultimately to rodents, herpetofauna, and birds that consume them (Whitford *et al*. 1998).

Problems Affecting Habitat or Species

Factors that are most likely to influence SGCN and the Western Great Plains Sandhill Sagebrush Shrublands in the Chihuahuan Desert Ecoregion are habitat conversion factors, abiotic resource use, and consumptive uses. Since the early 1950s, this habitat has been altered in the more southerly areas of the High Plains by agricultural conversion and practices, oil and gas development, excessive livestock grazing, and brush and weed control (through the use of herbicides) (Jackson

and DeArment 1963, Hunt and Best 2004). These factors have contributed to the decrease in habitat and increase in fragmentation for lesser prairie-chickens and sand dune lizards.

Agriculture and Livestock Production

Grazing practices on the Western Great Plains Sandhill Sagebrush Shrublands are varied and may potentially alter grassland habitats, depending on the grazing management practices used. The intensity and length of the grazing season, in combination with extant environmental conditions has the potential to change plant species composition, percent of vegetative cover, and physical habitat structure (Bock *et al.* 1984). Grazing management can be used as a tool to effect positive change in the plant community.

Sod busting (breaking of native prairie for developing cropland) continues on a small scale in the Western Great Plains Sandhill Sagebrush Shrublands and causes habitat fragmentation and loss through direct conversion.

Altered fire regimes, resulting from both fire suppression and the removal of fine fuels by domestic grazers and wildlife, also promote the establishment of both woody vegetation and non-native species.

Invasive and Non-Native Species

Soil Bank programs of the 1950s and 1960s also made use of non-native lovegrasses to stabilize topsoil. In the mid-1980s, the Conservation Reserve Program (CRP) was initiated to reduce the number of cultivated grain fields. At this time, lovegrasses were again planted. Older established plantings of weeping lovegrass are particularly persistent if grazed or burned. In some instances, range fires in these established grass stands have become more frequent, further reinforcing the persistence of this fire-adapted non-native grass.

Chemical Shrub Control

Shinnery oak is a management concern when it grows in dense stands, particularly where it comprises 80% of the annual plant production and competes with native grasses and forbs for water and nutrients (Pettit 1986). Shrub control in the 1980s made use of the herbicide tebuthiuron and nearly 40,500 ha (100,000 ac) of BLM lands in southeastern New Mexico were treated to reduce shinnery oak and to increase grass production for livestock grazing (Massey 2001). Control of shinnery oak affects lesser prairie-chickens and sand dune lizards. Lesser prairie chickens may use stands of dense shinnery oak; however, they prefer areas dominated by perennial mid and tall-grass species (Cannon and Knopf 1981). The sand dune lizard appears to be confined to areas of active sand dunes vegetated by shinnery oak and their peripheries where the uneven sandy terrain and wind-eroded blowouts meet their habitat requirements (Degenhardt and Jones 1972, Degenhardt and Sena 1976, Sena 1985, Snell *et al*. 1994, NMDGF 1996).

Other problems affecting habitat or species identified in the CWCS are off road vehicles and development and exploration. These factors are beyond the scope of this plan and the authorities of NRCS and its programs.

Prioritized Conservation Actions

1. Identify and promote grazing systems on rangelands that ensure long-term ecological sustainability and integrity and are cost effective for livestock interests.

2. Collaborate with federal and state agencies, and private landowners in restoration of the Western Great Plains Sandhill Sagebrush Shrublands. Restoration actions may include: restoration and return of abandoned croplands to native shrub/grassland; managed sustainable grazing that accounts for SGCN habitat concerns. Restoration will be conducted in a manner that will create a mosaic of habitats to benefit a variety of prairie wildlife.

3. Develop trials for the application of low levels (0.25-0.4 pounds of active ingredient) tebruthiron to determine the effectiveness to suppress shinnery oak and improve grass cover and production.

4. Work with Farm Service Agency (FSA) to improve habitat conditions and plant diversity in the Conservation Reserve Program through mid-contract management.

NRCS Programs: WHIP, EQIP, CRP (FSA), CSP, CIG

Western Great Plains Shortgrass Prairie

Habitat Condition

The current state of the shortgrass prairie is a product of both evolution and historical land use. Prairies in North America evolved with frequent disturbances, including fire, drought, grazing, and storms (Kaufman *et al.* 1988). The combined impact of these factors created a mosaic environment that accommodated a rich diversity of plant and animal species (Collins and Barber 1985, Plumb and Dodd 1993). Several authors (Anderson 1982, Plumb and Dodd 1993, Rickets 1999) suggest that the dominant, sod-forming perennial grassland plants of this region evolved under intensive grazing by wild ungulates. As a result, woody vegetation was suppressed and grazing tolerant plants flourished. The disturbance created by foraging bison, pronghorn and elk significantly affected vegetation, nutrient cycles, soil structure and composition and, as some areas were heavily grazed and others left untouched, created a diversity of habitat conditions across the prairie. The frequency of natural fires declined first due to reduction in fuels and later by intentional suppression. The compound effects fostered an invasion of shrubs into some historic shortgrass prairie areas (Brown 1982).

As for the current state of the shortgrass prairie, Dick-Peddie (1993) wrote, “The succession from plains-mesa grassland to juniper savanna will probably continue in many areas of the state. At the lower (drier) boundaries of plains-mesa grassland, many acres of grama grassland will become desert grassland, and much of the present desert grassland will become Chihuahuan or Great Basin desert shrubland. On many sites, these successional trends, which range users consider deterioration of grassland, were set in motion early in this century; subsequent range management efforts are unlikely to halt, let alone reverse the trend.”

Problems Affecting Habitats or Species

Habitat Fragmentation

The implications of habitat fragmentation have lead many ecologists to identify the process as one of the most significant factors affecting biodiversity (Harris 1984, Wilcox and Murphy 1985, Noss and Cooperrider 1994). Saunders *et al.* (1991) note that urban expansion, crop land, power lines, and road construction have accelerated over the past century, subdividing the natural world into disjunctive remnants of native ecosystems embedded in a matrix of anthropogenic land uses. Such development has caused large areas of formerly contiguous landscapes to become increasingly fragmented and isolated (Finch 2004).
Some authors (Barbour and Billings 1988, Ricketts 1999) believe that the primary factor affecting the Western Great Plains Shortgrass Prairie is conversion to crop land.

Grazing Practices

Grazing practices on the Western Great Plains Shortgrass Prairie are varied and may potentially alter grassland habitats, depending on the grazing management practices used. The intensity and length of the grazing season, in combination with extant environmental conditions has the potential to change plant species composition, percent of vegetative cover, and physical habitat structure (Bock *et al.* 1984). Grazing management can be used as a tool to effect positive change in the plant community.

Fire Management

The current state of the shortgrass prairie is a product of both evolution and historical land use. Prairies in North America evolved with frequent disturbances, including fire, drought, grazing, and storms (Wright and Bailey 1982, Kaufman *et al.* 1988, Anderson 1990, Debano *et al.* 1998, Rickets *et al.* 1999). Fire frequency and intensity appear to be synchronized by climate conditions, physiographic, edaphic and vegetation conditions (Daubenmire 1968, Swetnam and Betancourt 1990). Historically, grassland fires were caused by lightning and Native Americans (Payne 1982, Bahre 1985). However, widespread cultivation, excessive livestock grazing, and transportation corridors reduced standing biomass of fine fuels, and fragmented the landscape in prairie ecosystems, which decreased grassland fire frequency and intensity (Ford and McPherson 1996, 1998, Hart and Hart 1997, DeBano *et al.* 1998, Frank *et al.* 1998). These changes virtually eliminated fire as an ecological process.

Invasive Species

Many ecologists have acknowledged the problems caused by invasive species increasing in communities or ecosystems and the associated negative effects on global patterns of biodiversity (Stohlgren *et al.* 1999). Once established, invasive species have the ability to dominate a plant community, disrupt nutrient and fire cycles, and alter the character of the community by enhancing susceptibility to additional invasions (Cox 1999, Deloach *et al.* 2000, Zavaleta *et al.* 2001, Osborn *et al.* 2002). Lee (1999).

Other problems affecting habitat or species identified in the CWCS are off road vehicles, development and exploration, and military activities. These factors are beyond the scope of this plan and the authorities of NRCS and its programs.

Prioritized Conservation Actions

1. Identify and promote grazing systems on rangelands that ensure long-term ecological sustainability and integrity and are cost effective for livestock interests.

2. Promote grassland restoration that encourages increased native herbaceous cover. This action may include the chemical, mechanical, or biological control of invasive woody species.

3. Work with Farm Services Agency (FSA) to improve habitat conditions in the Conservation Reserve Program through mid-contract management.

NRCS Programs: WHIP, EQIP, CRP (FSA) CSP

STATEWIDE DISTRIBUTED RIPARIAN HABITATS

"Riparian ecosystems" are defined as an assemblage of plant, animal, and aquatic communities whose presence can be either directly or indirectly attributed to stream induced or related factors (Kauffman and Krueger 1984). Riparian ecosystems support a greater diversity of plants and animals than upland habitats. A significant percentage of all wildlife in the Southwest uses riparian habitat (Thomas *et al.* 1979, Johnson *et al.* 1977) and approximately 80% of all sensitive vertebrate species in New Mexico depend upon riparian or aquatic habitats at some time during their life cycle (NMDGF 2000).

Wetlands and riparian ecosystems comprise less than 2% of our arid western landscape and less than 1% of New Mexico (Dahl 1990, Henrickson and Johnston 1986, Allen and Marlow 1992). Riparian habitats occur where water is perennial, intermittent, or ephemeral. Their relatively small size, linear configuration, complexity, and variation present a significant challenge to mapping their aerial extent through remote sensing technology. To date, there are only estimates of the acreage of riparian habitats in New Mexico. During the last century, New Mexico and Arizona have lost an estimated 90% of their original riparian ecosystems (Krzysik 1990). These habitats have been most negatively affected by human activities in the Southwest (NMDGF 1988). However, despite the relative scarcity of riparian habitat, its variety promotes considerable diversity in floral and resident and migratory faunal communities (Pase and Layser 1977). Durkin *et al.* (1996) describe ecosystem processes that are essential to healthy, desirable riparian systems:

Habitat Condition

The quantity and quality of riparian habitats essential for the survival of many of New Mexico's SGCN have been significantly diminished. It is estimated that fully one third of the wetlands that once existed in New Mexico have been lost (Dahl 1990). There was an 87% decrease in wetland acreage along the main stem of the Rio Grande from 1918 to 1982 (Hink and Ohmart 1984).

Many riparian systems have been extensively altered and/or fragmented because they occur in the broad valley floor and are therefore suitable for human occupation and agricultural uses. The integrity and quality of riparian habitats is variable due to development along river floodplains, channel modification, occurrence of scouring spring flows, and improper grazing practices that occur within riparian habitats. The result is a wide range of habitat quality ranging from very good to very poor (USFWS 1993).

Riparian and stream ecosystems have largely been degraded by ecosystem-wide, off-channel activities and, therefore, cannot be restored by focusing solely on manipulations within the channel. Riparian systems, despite a popular perception of fragility, are often quite resilient (Baker *et al*. 1999). Numerous riparian areas are at risk because of various stresses, such as improper grazing by livestock and wildlife. Drought and flooding have caused many riparian areas to lose their dynamic equilibrium. However, once these stresses are relieved, many riparian systems can regain their equilibrium within a few years because of resilient, native, herbaceous, riparian plants such as sedges and rushes (Medina 1996).

Floodplain-Plains riparian communities occur along the major rivers of New Mexico. The middle Rio Grande Corridor is a representative example of Floodplain-Plains riparian habitats. It encompasses a changing mosaic of habitats including: 1) natural riparian habitats dominated by native Fremont cottonwood and/or willow with differing degrees of exotic saltcedar and/or Russian olive encroachment, 2) monotypic stands of exotic saltcedar or Russian olive, 3) marshes primarily dominated by cattail and hardstem bulrush, 4) mowed river edge areas dominated by grasses such as alkali sacaton, 5) active agricultural areas such as pecan orchards and row crops, and 6) manipulated riparian areas associated with agricultural irrigation channels generally dominated by wolfberry and fourwing saltbush (Leal *et al.* 1996).

The riparian system of the middle Rio Grande is referred to as the Rio Grande cottonwood alliance (Muldavin *et al.* 2000), the Rio Grande bosque (Crawford *et al.* 1993), and the Floodplain Riparian classification (Dick-Peddie 1993). Mature, native Rio Grande cottonwood trees dominate the canopy of this riparian galley forest. The bosque usually appears as a narrow strip up to 650 ft (200 m) in width. Laterally, its distribution within the presently active floodplain is mostly constrained by levees and bluffs. These communities are adapted to floodplain environments with significant available moisture from periodic flooding, shallow groundwater, standing surface water, and unstable substrata.

Historically, floods caused multiple channels and sandbars, washed away stands of trees, and created wetlands resulting in heterogeneous patchworks of vegetation communities and age classes. Flood frequency and intensity has decreased due to the construction of dams. The water table has decreased in many areas, river channels have been straightened and levied, banks have been stabilized, and the natural shifting of channels has been virtually halted. The river channel is narrowing and deepening in many locations, and vegetation is stabilizing the riverbank. Historically, the riparian forest was probably a constantly changing mosaic of often discontinuous, uneven-aged cottonwood and willow communities. Most of the dominant trees would have originated during periods of over-bank flooding. At such times, open areas among the riparian forest communities would have contained wetlands such as marshes, wet meadows, and oxbows depending on the topography of the floodplain and the proximity of the river. These combined

conditions have had a significant effect on vegetative communities. An example is the middle Rio Grande (Fullerton and Batts 2003). In the northern portion there is little or no recruitment of native riparian plants outside of the immediate banks and sandbars of the river channel. Large amounts of sediment enter the river at the confluences of the Rio Puerco and Rio Salado (Lagasse 1980) and flow is insufficient to move this sediment farther downstream. Elephant Butte Dam has caused the base elevation to raise upstream enhancing channel widening, deposition, braiding, and aggrading. Sediment deposition creates a substrate for establishment of riparian vegetation, both native and exotic. Subsequently, the cottonwood bosque as a whole is being replaced by introduced species, including saltcedar, Russian olive, and Siberian elm (Fullerton and Batts 2003). Saltcedar is part of the sub-canopy at many sites and occurs in extensive, continuous open stands.

The condition of xeric riparian communities is largely unknown. Many of these types are linear strands except for playa types and greasewood flats. These communities are common throughout the state but can be highly fragmented due to natural and anthropogenic sources. Though acknowledged as important habitat, relatively few studies have focused on these riparian types. Few studies have looked at the condition of these sites and often condition procedures such as Proper Functioning Condition do not apply to these vegetation types.

Problems Affecting Habitat or Species

Natural Flow Regime

Successfully conserving riparian biodiversity and a river's natural ecosystem function is strongly dependent on the ability to protect or restore natural flow regimes (Stanford *et al.* 1996, Poff *et al.* 1997, Richter *et al.* 1997).

The natural flow regime has also been modified by reservoirs, the channel stabilization measures that prevent river migration. Stream flow depletions from irrigation diversions and channel straightening are prevalent.

Habitat Conversion

Habitat conversion can be caused by both natural and anthropogenic sources. Conversion can be as severe as a type conversion (change from one vegetation community to a completely different community) or subtler such as changing dominant plant densities or changing plant strata composition. Habitat alteration from agricultural and livestock production or timber harvest can influence riparian habitats. Serious impacts contributing to the degradation of overall watershed conditions have come from excessive logging (Boles and Dick-Peddie 1983). Concentrated flow of surface runoff from dairy farms or agricultural chemicals may limit the capability of riparian buffers to remove pollutants and absorb and contain pollutants, allowing them to reach streams (Davis *et al.* 1999).

Invasive Species

Invasive species can significantly influence the integrity of riparian areas. Invasive plants can disrupt the structure and stability of native plant communities and degrade native wildlife habitat by

successfully competing with and replacing native plant species and consuming limited sources of moisture. Along the Rio Grande, exotic species represent more than 25% of herbaceous plant species and more than 40% of tree species (Muldavin *et al.* 2000). Several of the most aggressive exotic plant species in the United States are invaders of riparian areas. Stohlgren *et al*., (1998) suggested that the disturbance regimes characteristic of riparian areas might make riparian communities particularly vulnerable to invasion by non-native plant species.

Grazing Practices

Grazing practices in riparian areas are varied and may potentially alter grassland habitats, depending on the grazing management practices used. The intensity and length of the grazing season, in combination with extant environmental conditions has the potential to change plant species composition, percent of vegetative cover, and physical habitat structure (Bock *et al.* 1984). Grazing management can be used as a tool to effect positive change in the plant community.

Fire Management

Forest fires in riparian systems of the southwest have been increasing in number and severity, due to increased litter-layer fuel accumulations from reduced flooding events, and more frequent natural and anthropogenic ignition events (Molles *et al*. 1995, Ellis *et al.* 1998, Bess *et al.* 2002).

Fires historically were not a primary disturbance factor in the floodplain bosque forests, but are currently a major disturbance factor (USFWS 2002). Some of the dominant trees, notably Fremont cottonwood and Rio Grande cottonwood are not considered to be fire-adapted (Busch 1995) and show neither resistance nor resilience to fires.

Prioritized Conservation Actions

1. Work with federal and state agencies, private landowners to design and implement riparian habitat restoration projects. These may include either passive (stopping the causes of degradation) or active (manipulating) approaches at a watershed or landscape level.
2. Define and implement grazing methodologies on rangelands that ensure long-term ecological sustainability and integrity and are cost effective for livestock interests.
3. Cooperate with federal and state agencies in the implementation of Endangered Species Recovery Plans that address riparian restoration or management.
4. Encourage riparian restoration approaches that employ a combination of replacing elements and processes, as opposed to replacing elements alone.
5. Work with federal and state agencies and private landowners to design and implement saltcedar control treatments within areas along the Pecos River occupied by declining species to avoid adverse impacts during their breeding season.
6. Incorporate findings of NRCS Plant Materials Center field trials for developing restoration plans on difficult sites such as those with high salinity.

NRCS Programs: WHIP, EQIP, Continuous CRP (FSA), CSP

Wetlands

The Playa Lakes Joint Venture with FWS and others adds emphasis to the improvement of playa wetlands. This group is actively seeking projects, and is a perfect tie in with WHIP. The great number of playa wetlands in eastern New Mexico on private lands provides the opportunity for enhancements. There are several existing WHIP plans on playas and cienagas, many more are in need of assistance, and landowners are interested. Improvements of these habitats could benefit waterfowl, amphibians, aquatic invertebrates, shorebirds, and many other species. The Intermountain West Joint Venture wishes to become an interested partner in these efforts. Some practices to conserve playas include fencing, building nesting islands, and vegetation plantings.

Prioritized Conservation Actions

1. Identify and promote grazing systems on rangelands that ensure long-term ecological sustainability and integrity and are cost effective for livestock interests.
2. Restore native plant community.
3. Restore wetland hydrology.
4. Encourage the establishment of buffers around wetlands to provide nesting habitat, reduce sedimentation, and to protect water quality.

NRCS Programs: WHIP, EQIP, Continuous CRP (FSA), CSP

Partnership Development

Several opportunities exist for partnership development or improvement. Some MOUs are already in place with organizations such as the Rocky Mountain Elk Foundation, Bat Conservation International, National Wild Turkey Federation, New Mexico Audubon and Ducks Unlimited. Many other organizations could be involved with partnering. Some of these are Trout Unlimited, Pheasants Forever, American Bird Conservancy, Partners in Flight, and Playa Lakes Joint Venture. NRCS in New Mexico is already working with the New Mexico Department of Game and Fish and with the U.S. Fish and Wildlife Service on various habitat projects. The Intermountain West Joint Venture provides funds for private land projects, on any kind of habitat. The Playa Lakes Joint Venture primarily fund playas and wetlands type projects.

Several Native American Tribes are cooperators of long standing and provide many resources for projects including funding studies and inventories, labor, consultants. Projects are in the initial stages of planning, which are eligible for WHIP and have the support of the Tribal Councils.

New Mexico Department of Game and Fish has proactive programs throughout the gamut of wildlife habitat. We have cooperated on projects in the past and fully expect to do so again. WHIP ties in with their programs at several levels and areas. The Biota Information System of New Mexico can be used to determine documented occurrences of special status species.